Appendix 11: Environmental Sampling Protocols

SOP 100
Environmental Assessment and XRF Sampling

1. **Purpose**: The purpose of this SOP is to establish uniform procedures for the collection of information for the completion of the environmental Assessment Forms and XRF sampling for determination of presence of lead-based paint.

2. **Application**: The procedures outlined in this SOP are applicable to all personnel collecting environmental samples for the Jasper Exposure Study 2000.

3. **General Guidelines**: Direct reading XRF measurements will be made on selected interior and exterior surfaces that are painted or varnished. The condition of the painted surfaces will be recorded.

4. **Selection of Sample Locations**: The "Home Schematic Form (FRM 100)" will be completed.
- 4.1. XRF sampling will be performed in the child's bedroom, kitchen, child's main play area, and exterior walls and porches.
- 4.2. Components to be sampled include walls, window components, door components, ceilings, floors that are painted or coated, baseboards, and mini blinds.
- 4.4. Closets will not be included unless it is an integral part of the room.

5. **Sampling Equipment**: Sampling equipment will consist of a minimum of:
- 5.1. Portable XRF unit
- 5.2. Small stepladder
- 5.3. Flashlight
- 5.4. Tape measure

6. **Method of Sampling**:
- 6.1. Complete the "Home Schematic Form (FORM 100)".
  - 6.1.1. Place pre-prepared ID sticker on top left corner and add date.
  - 6.1.2. Include a room plan sketch on the back of FORM 110 used for each room.
    - 6.1.2.1. All schematic diagrams will be labeled using the convention of: Main address exterior wall labeled 'A' with sequential lettering (B, C, and D) in a clockwise direction. The room numbering will be '1' for the child's bedroom, '2' for the kithcen, and '3' for the child's main play area. On the sketch clearly indicate the direction for North.
  - 6.1.3. Complete the general information questions for the home.
    - 6.1.3.1. Inspector and location type information.
    - 6.1.3.2. Exterior covering type, source and type of water pipes (See key at bottom of form 100).
  - 6.1.4. Complete information for each room to be sampled.
    - 6.1.4.1. Floor is the floor of the house. The front entry floor area is floor '1'. If there is a basement or lower floor than it is indicated as '0'.
    - 6.1.4.2. Indicate floor type from the key at the bottom of the data collection form 100.
    - 6.1.4.3. If not wall-to-wall carpet, indicate if piece carpet is present. A 'N' circled indicates no piece carpet present.
    - 6.1.4.3. If the child's bedroom or kitchen is also the child's main play area than indicate here as a 'Y'. If not indicate 'N'.

6.1.4.4. Indicate the general condition of neatness of the room on a lickert. See key at bottom of data collection form 100.

6.2. XRF measurements are obtained in the interior on a room-by-room, two exterior walls, and one exterior porch. One sample is taken from each unique test combination. A test combination is determined by component type and substrate material. (Form 110).

6.2.1. Interior sampling within each of the child's bedroom, kitchen and child's main play area.

6.2.1.1. One sample representative of the most accessible interior window area. Take the sample from the sash.

6.2.1.2. One sample representative of the most accessible outer window area (casing, stool, trough, apron, stop). Take the sample from the stool.

6.2.1.3. One sample representative of the most accessible interior door area. Take the sample from the door. **Note:** If no door is present, this sample is not taken.

6.2.1.4. One sample representative of the most accessible outer door area. Take the sample from the jam. **Note:** If no door is present, this sample is not taken.

6.2.1.5. One representative floor sample from wood stained or clear coated floors.

6.2.1.6. One representative ceiling sample.

6.2.1.7. One sample of the most accessible wall.

6.2.1.8. One sample of the most accessible baseboard if present.

6.2.1.9. One sample of the most accessible radiator if present.

6.2.1.10. One representative sample of cabinets and/or shelfs.

6.2.1.11. One representative miniblind. Miniblind samples are obtained by pulling the drawstring to collect approximately one-inch of thick collection of blinds. Sample is taken from top blind of stack.

6.2.2. Exterior sampling. (Form 120).

6.2.2.1. Samples are taken from only two wall sides. The first wall will be the side with the MAIN PORCH, or if no porch than WALL A. The second wall is at the discretion of the environmental specialist. If there is an obvious difference among the walls, the second wall should be selected to represent this.

6.2.2.1.1. From each of the two walls take one sample representative of each test combination of: wall, window well, window sash, door and door jam.

6.2.2.2. Main Porch. Only one exterior porch is sampled. If more than one porch is present the environmental specialist must decide which porch is most representative in usage.

6.2.2.2.1. One sample representative of each porch component: ceiling, floor, bannister, column). If doors and windows are present they should be included as part of 'wall' form.

6.3. Obtaining XRF Measurements.

6.3.1. Perform XRF calibration check prior to use, at the end of each sampling day or every four hours, and if the instrument is knocked, dropped or other impact, turned off for more than two hours, or been exposed to extreme temperature changes for more than one hour. Using the 1.02 mg/cm^2 source (or other as recommended by the PCS). Take three consecutive measurements. Record calibration information and results on Form 920. If any single measurement is off by more than 0.4 mg/cm^2, or the average of each of the three measurements is off by more than 0.2 mg/cm^2, then turn the instrument off, then on again, and repeat. If this occurs again contact the manufacturer concerning how to correct this.

6.3.2. If surface is visibly soiled or dusty, wipe surface with a non-alcohol wipe as necessary and/or place a piece of plastic or paper (such as tissue) between the instrument and surface. Use a clean piece of paper or plastic that has previously been checked for

possible interference. This is to ensure that the XRF window is not contaminated and sample results are from the paint and not surface deposited material. If this surface will be used for a wipe sample, perform the wipe sample first (See SOP 250).

6.3.3. On FORM 110 for each area tested enter all the following information on a new form:

6.3.4.1 Place pre-prepared ID sticker and add date.

6.3.4.2 Indicate inspector and xrf instrument.

6.3.4.3 For indoor samples indicate room number (1 – child's bedroom, 2 – kitchen, 3 - child's main play area).

6.3.4.4 Indicate number of doors and windows in sample area for rooms and walls.

6.3.4.5 For each XRF sample taken for the specific components indicated on the form:

6.3.3.5.1. If condition intact, fair or pair:

6.3.3.5.1.1. For all surfaces intact indicates no obvious visible deterioration.

6.3.3.5.1.2. Indoor large surface: less than 2 ft^2 deterioration then fair, if greater than 2 ft^2 deterioration than poor.

6.3.3.5.1.3. Indoor and outdoor small surface: less than 10% deterioration then fair, if greater than 10% deterioration than poor.

6.3.3.5.1.4. Outdoor large surfaces: less than 10 ft^2 deterioration than fair, if greater than 10 ft^2 deterioration than poor.

6.3.3.5.2. Estimated percent of total damage area represented by this sample.

6.3.3.5.3. XRF result (mg/cm^2) reported by instrument.

6.3.4. On FORM 120 for the two exterior/outdoor walls tested enter all the following information.

6.3.4.1 Place pre-prepared ID sticker and add date.

6.3.4.2 Indicate inspector and xrf instrument.

6.3.4.3 Indicate location letters for Wall 1 and Wall 2. Wall 1 should either contain the MAIN PORCH an/or be WALL A.

6.3.4.4 Indicate number of doors and windows. This is the combined number for the two walls selected and includes those within a porch area.

6.3.4.5 For each XRF sample taken for the specific components indicated on the form:

6.3.3.5.1. If condition intact, fair or pair:

6.3.4.5.1.1. For all surfaces intact indicates no obvious visible deterioration.

6.3.4.5.1.2. Indoor and outdoor small surface: less than 10% deterioration then fair, if greater than 10% deterioration than poor.

6.3.4.5.1.3. Outdoor large surfaces: less than 10 ft^2 deterioration than fair, if greater than 10 ft^2 deterioration than poor.

6.3.3.5.2. Estimated percent of total damage area represented by this sample.

6.3.3.5.3. XRF result (mg/cm^2) reported by instrument.

6.3.5. On FORM 120 for the MAIN PORCH enter all the following information.

6.3.4.1 Place pre-prepared ID sticker and add date.

6.3.4.2 Indicate inspector and xrf instrument.

6.3.4.3 Indicate wall letter the MAIN PORCH is located.

6.3.4.4 For each XRF sample taken for the specific components indicated on the form:

6.3.3.5.1. If condition intact, fair or pair:

6.3.5.4.1.1. For all surfaces intact indicates no obvious visible deterioration.

6.3.5.4.1.2. Indoor and outdoor small surface: less than 10% deterioration then fair, if greater than 10% deterioration than poor.

6.3.5.4.1.3. Outdoor large surfaces: less than 10 ft^2 deterioration than fair, if greater than 10 ft^2 deterioration than poor.

6.3.3.5.2. Estimated percent of total damage area represented by this sample.

6.3.4.5 XRF result (mg/cm^2) reported by instrument.

SOP 1100
Soil Sampling

1. **Purpose**: The purpose of this SOP is to establish uniform procedures for the collection of soil samples.

2. **Application**: The procedure outlined in this SOP are applicable to all personnel collecting environmental samples for Jasper County for the Jasper Exposure Study 2000

3. **General Guidelines**: A rough sketch of the aerial view of the yard will be made which includes the division and indication of the yard areas into sample site categories of: drip line, yard non-play areas, and high contact/play areas. A composite soil sample will be collected from each category. Disposable gloves will be worn for the collection of all samples.

4. **Selection of Sample Locations**:

    4.1. Soil sampling will include a composite collected from the general yard non-play area, dripline area within three feet of structure walls, and yard primary play areas of the child.
    4.2. An aerial view diagram of the residence and property will be sketched on the reverse side of the Soil Collection Form (Form 1100). The drip line will include the areas contiguous with and extending three feet from the house walls. The yard non-play area will extend from the drip line to the yard outer boundaries. Play areas will be extend three-feet around any playground type equipment or other indication of play area.
    4.3. Drip Line
        4.3.1. The drip-line soil composite sampling sites (8) will be located and taken from non-vegetated areas as close as possible to 1/3 and 2/3 the distance along each wall and 1-1/2 feet away from the wall and any water discharge locations (i.e. two sample along each of four walls).
    4.4. Yard Non-Play Area
        4.4.1. Sampling sites for the general yard will be determined by superimposing on "X" using the property corners for each endpoint. Sample sites (8) that do not contain vegetation will make up a composite sample and will be located as close as possible to 1/3 and 2/3 the distance along each leg of the “X” between a point starting three feet away from the residence and extending to the property line (i.e. two samples along each of the four segments of the “X”).
    4.5. High Contact/Play Area

4.5.1. Play area samples (8 or 16) will be taken in a similar manner as the yard non-play area. Up to two primary play areas will have an "X" superimposed over the designated area. Samples are collected from non-vegetated areas as close a possible to 1/3 and 2/3 the distance along each leg of the "X" (total of 8 samples). If two primary areas are indicated, the two areas will be composited together (total of 16 samples).

5. **Method of Sampling**:

5.1. Label sample storage container with residence ID sticker, sample number and date. Sample numbers will be: for yard non-play area (Y-1), high contact/play area (P-1), and drip line (D-1).

5.2. Complete Soil Collection form (Form 1100) for composite sample to be obtained. This will entail:

5.2.1. Place sticker on form and indicate date.

5.2.2. Determining the percent of bare ground (exposed soil) to covered ground in the region sampled. Covered ground is considered vegetation and hard surfaces (concrete, asphalt, etc.).

5.2.3. Following sample collection indicate total number of samples used for composite.

5.2.4. If no non-vegetated areas were available for a sample, select a vegetated area within the sample area and collect a sample, removing as much of the vegetation from the sample as possible. Record the total number of samples taken from vegetated areas.

5.3. Place on new pair of disposable gloves for each composite type.

5.4. Insert collection instrument ½ to 1 inch into soil and remove soil.

5.5. Remove any vegetation from top of soil sample and add to collection container.

5.6. Dispose of any remaining soil and wipe residual soil from sample probe.

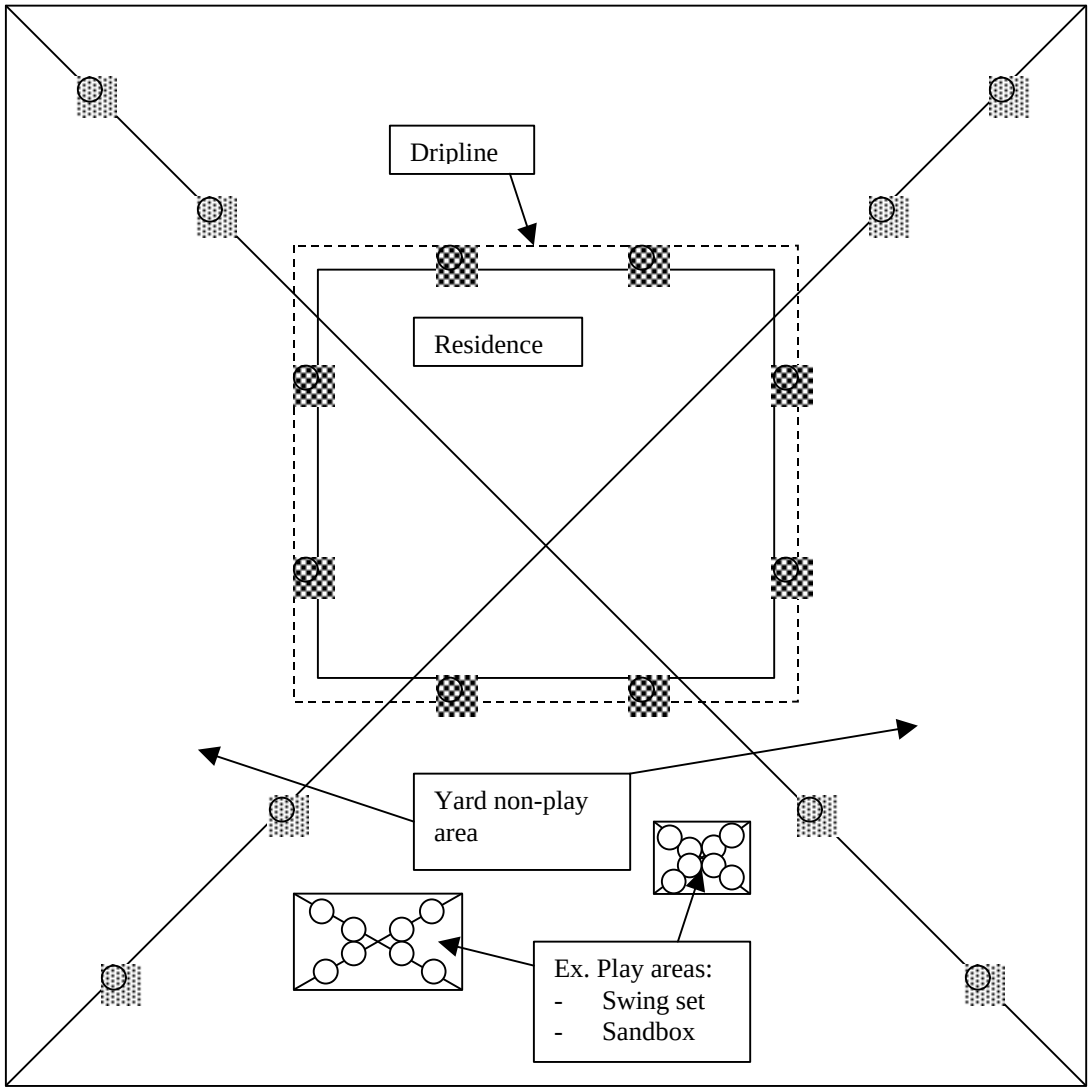
5.7. Continue the process at each sample site placing each new composite into sample container until at all samples have been collected for a specific composite type. Repeat for all composite types.

5.8. De-contaminate sample probe by wiping off all visible soil with gloved hand and paper towels and baby wipes.

5.9. Dispose of all waste at health department.

5.10. Soil Standard Reference Material

5.10.1. For every 20th composite soil sample (approximately 17 residencies) insert a SRM with the laboratory sample submittals (see SOP 900 Field and Laboratory QA/QC).



○ - Play area sample sites

- Yard non-play area sample sites

- Dripline

SOP 250
Dust Wipe Sampling

1. **Purpose**: The purpose of this SOP is to establish uniform procedures for the collection of interior dust wipe samples.

2. **Application**: The procedures outlined in this SOP are applicable to all personnel collecting environmental samples for the Jasper exposure study 2000.

3. **General Guidelines**: Samples will consist of composite wipes from each location type. Wipe sample site selection and collection will be performed after the "Home Schematic (FRM 100)" form has been completed. All floor areas sampled will use a template. Disposable gloves will be worn for the collection of each sample.

4. **Selection of Sample Locations**: Wipe samples for composite will be obtained from a window stool, floor and miniblind of the study child's bedroom, kitchen and child's main play area

4.1. Window Stool: In each room a window indicated or considered to be most frequently used and/or of greatest access to the child will be sampled. A window stool will always be sampled unless no windows are available.

4.2. Surface Floor Wipes: Floor composite wipe samples will be taken from the closest accessible location to the window sampled or other window. If no window areas are available, then the closest accessible location to the inside hinge of the room entry door will be sampled.

4.3. Miniblinds: Miniblind composite wipe samples will be taken from a miniblind indicated or considered to be present at the most frequently used window and/or of greatest access to the child will be sampled.

5. **Sampling Equipment**: Sampling equipment will consist of a minimum of:

5.1 Disposable gloves
5.2 Individually wrapped sampling wipes
5.3 Wash'n Dry Baby Wipes or similar product for cleaning of tools/templates
5.4 Measuring tape
5.5 50 ml centrifuge tubes with screw top caps.
5.6 Sampling area template for floor
5.7 Sealable container to be used for waste materials. No waste materials will be disposed of on-site.

6. **Method of Sampling**:

6.1. Place sticker in top left corner of form and add date.

6.2. Prepare sample collection tube with complete sample number and date. The sample number consists of case ID# and assigned sample number (e.g. 131-F-1 for a floor sample). Sample numbers for each type are indicated on Form 250.

6.3. Record all information on Dust Wipe Collection Form (FORM 250).

6.3.1. Dimensions of the area wiped to the closest quarter inch. For a window stool this should be a rectangular area adjacent to the window sash, and not to include edges along the side of the vertical window casing. For a floor use supplied template (dimensions are already recorded on form 17 by 17 inches). For miniblind pull draw string to obtain a collection of miniblind slats approximately one-inch thick. Wipe between the drawstrings for the first wipe, pull the drawer string for another inch and wipe top slat for second wipe, and repeat for third wipe. The dimensions (area wiped) will be the width of the combined three slats (i.e. width of slat one times 3) by the length of the slat.

6.3.2. If surface being wiped is deteriorated, such as chipping and flaking paint, delaminating, and so on, indicate yes, otherwise no.

6.3.3. If see visible loose soil/dust in the sample area then yes, otherwise no.

6.3.4. If see visible paint chips in the sample areas then yes, otherwise no.

6.3.5. Only comments concerning conditions or sampling procedure that would affect interpretation of results should be recorded.

6.4. Place on new pair of disposable gloves for each composite sample type. If gloves become soiled between samples within the composite, change gloves prior to taking additional samples.

6.5. When template for floor is being used, first wipe clean with a baby wipe for decontamination.

6.6. Remove a sampling towelete from package and carefully unwrap.

6.6.1. For window stools and floors, place flat at one end of the sample wipe area and wipe in an 'S' pattern over the entire surface making sure that each stroke only slightly overlaps the previous stroke. Fold the wipe in half with the dirt side inside, and then re-wipe the stool at 90^{o} from the first wipe. Fold the wipe a second time in the same manner and re-wipe similar to the first wipe. Fold the wipe three additional times with the dirt side inside, and place into the pre-labeled sample container.

6.6.2. For miniblinds use long 'S' type strokes going along the length of the slat back and forth until complete slat covered. Fold wipe as described above and repeat on next slat, and again fold wipe third time and repeat on last slat.

6.7. Place wipe into pre-labeled sample container.

6.8. Continue until all wipes of each type have been composited into their respective sample containers. No more than three wipes should be composited together.

6.9. If a sampling area template was used, decontaminate with a Wash'n Dri wipe prior to each use.

6.10. All waste such as gloves and cleaning towelets shall be placed in a sealable garbage container disposed of at the health department site.

6.11. Insert quality assurance samples into prepared tubes and record on data form as appropriate. (See SOP 900 Field and Laboratory QA/QC).

6.11.1. Wipe Field Sample Blanks

6.11.1.1. At the last sample site of the day, each day, prepare a field wipe sample labeled as sample number Q-1 and indicate on Form 250 for that sample site.

6.11.1.2. Place on a new pair of gloves. Removing a wipe, unfold it, and then fold three times as would be performed during a typical wipe sample.

6.11.1.3. Place sample into sample container.

6.11.2. Glove Field Sample Blanks

6.11.2.1. At every 20th residence environmental samples are collected a field glove blank will be submitted for sample analysis.

6.11.2.2. Place on a new pair of gloves. Removing a wipe, unfold it, and then wipe each hand thoroughly three times, folding following each wipe. Place into pre-labeled container as sample number G-1 and date, and indicate on Form 250 for that sample site.

6.11.3. Wipe Standard Reference Material (SRM).

6.11.3.1. For every 50th wipe sample (approximately every 6th residence) a SRM will be inserted with the laboratory sample submittals.

6.11.3.2. Randomly select a prepared wipe SRM sample. Record the SRM Code Number from the plastic bag containing the tube onto Form 250 for the last residence of that day. Place on the sample tube the residence sticker and record sample number WS-1 and date, and indicate on Form 250 for that sample site.

SOP 350
Water Sampling

1. **Purpose**: The purpose of this SOP is to establish uniform procedures for the collection of private well drinking water samples.

2. **Application**: The procedure outlined in this SOP is applicable to all personnel collecting environmental samples for the Jasper County, Missouri Superfund Site Follow-up Childhood Lead Exposure Study.

3. **General Guidelines**: Water samples are to be collected at homes on a private water supply (i.e. private well) from kitchen faucet. Submit at least 500 milliliters of water in a one-quart cubitainer. Fill out Private Water Supply request form Lab 65 (R4-92) for each sample. Be sure identification on the request form and on the label of the sample cubitainer match. Ship samples as soon as possible after collection to the Missouri Department of Health State Public Health Laboratory (MDHSPHL). Samples must arrive within two weeks of collection. Water samples for lead analysis are acidified upon receipt in the laboratory

4. **Sampling Equipment**: Sampling equipment will consist of a minimum of:
   - 4.1. Disposable gloves
   - 4.2. One-quart cubitainers or other MDOH State Public Laboratory supplied sampling containers
   - 4.3. Masking tape
   - 4.4. Large sealable plastic bag

5. **Method of Sampling**:

   - 5.1. Complete Private Water Supply Collection form.
     - 5.1.1. Place ID sticker in upper left hand corner and add date.
   - 5.2. Label sample containers with residence ID sticker and sample number W-1.
   - 5.3. Flush water line by letting the water run for at least 5 minutes before collecting sample.
   - 5.4 Place on disposable gloves
   - 5.5 Expand container if needed (hold neck and pull outward). Do not blow into container. Rinse three times with water to be collected.
   - 5.6 Fill cubitainer with at least 500 ml of water from tap (50% of container).
   - 5.7 Screw on cubitainer cap securely.
   - 5.8 Tape cap securely with masking tape and place into plastic bag.
   - 5.9 Complete MDHSPHL Private Water Supply submittal form.
   - 5.10 Ship samples through first class mail so that it arrives at the Department of Health State Public Health Laboratory within three (3) days of the collection date. Blue mailing labels should be available from the lab. If no labels available use address: Missouri Department of Health, State Public Health Laboratory, 307 West McCarty, Jefferson City, MO 65101.
   - 5.11 Place used gloves in a garbage bag for dispose at the health department site.

SOP 900
Field And Laboratory QA/QC

Purpose: The purpose of this SOP is to establish uniform procedures for the collection and submittal of laboratory quality control samples and field XRF measurements.

Application: The procedure outlined in this SOP are applicable to all environmental sampling for the Jasper 2000 Exposure Study.

General Guidelines: Laboratory samples submitted for anlaysis will include, as described below, field wipe and protective glove blanks, and dust and soil standard reference material spikes. Field use XRF's will have their calibrations checked each day of use.

QA/QC Types:

- **Standard Reference Material**
  - As one of the components to assess laboratory analysis quality control the following will be performed:
  - Spiked wipe (2%) and soil (2%) samples prepared by an AIHA accredited laboratory using NIST standard reference materials (SRM) will be submitted with normal field samples.
- **Field Blanks**
  - To assess possible contamination from field practice and/or sample media substrate interference the following will be performed:
  - One dust wipe field blank per sampling day per sampling team will be submitted for laboratory analysis.
  - One field blank per every 20th residence per sampling team will be submitted for laboratory analysis of protective gloves.
- **XRF Calibration Check**
  - To ensure proper operation and sample results with the field use XRF's, calibrations will be checked each day of use. The minimum calibration checks will be prerformed:
    - Prior to use.
    - Every four hours.
    - If the instrument has been turned off for more than two hours.
    - If the instrument is dropped or other impact, or been exposed to extreme temperature changes for more than one hour.

- At the end of each day of use.

Standard Reference Material: SRM samples shall be submitted as part of the regular sample submittal process in a manner so that the laboratory cannot distinguish the spiked samples from the field samples. Spiked wipe samples will be submitted for every 50 field wipe samples (2%). Spiked soil samples will be submitted for every 50 field soil samples (2%).

- The spiked samples will be given the ID of the location of the last home performed on the sample day each SRM is submitted. Sample numbers for wipe SRM's will be WS – 1, and for soil YS – 1.
- The sample ID and number used for the SRM submitted to the laboratory will be recorded on form 900, the Standard Reference Material Tracking form. The SRM Code number will also be recorded on Form 250 for wipes and Form 1100 for soils of the respective sample site.

Field Blanks: Field sampling media blanks for wipes will be submitted to the laboratory at a rate of one per sampling day per sampling team. Field blanks for gloves will be submitted at a rate of 1 per 20 sampling sites per sampling team. Field sample blanks will be prepared during the sampling at the final sample site of the day.

Wipe field blanks will be obtained by removing a wipe from the sealed container, and while wearing new protective gloves unfold, then refold the wipe as if wipe samples were being taken.

Glove field blanks will be obtained by removing two new gloves as would normally be performed and placing on the hands. Three swipes over both gloved hands will be made, folded between each wipe, and the wipes submitted as field blanks for the gloves in a sample container.

These wipes are then place into a labeled sample container in the same fashion as the field samples. On the sample collection form (Form 250) for the respective site the field blanks are recorded. Wipe field blanks are given the designation Q - 1 and glove field blanks the designation G - 1.

XRF Calibration: Perform XRF calibration check prior to use, at the end of each sampling day or every four hours, and if the instrument is knocked,

dropped or other impact, turned off for more than two hours, or been exposed to extreme temperature changes for more than one hour.

Using the 1.02 mg/cm^2 source supplied by the manufacturer (or other as recommended by the Performance Characteristic Sheet specific to this unit). Take three consecutive measurements. Record calibration information and results on Form 920. If any single measurement is off by more than 0.4 mg/cm^2, or the average of the three measurements is off by more than 0.2 mg/cm^2, then turn the instrument off, then on again, and repeat. If this occurs again contact the manufacturer immediately concerning how to correct this.

SOP 910
Sample Chain of Custody, Storage and Transport

Purpose: The purpose of this SOP is to establish uniform procedures for completion and compliance with the chain of custody requirements, storage requirements and transport of samples to the laboratory or secondary storage location.

Application: The procedures outlined in this SOP are applicable to all environmental sampling for the Jasper Exposure 2000 Study.

General Guidelines: At the end of each sample day "Chain of Custody Record" (Form 910) forms will be completed for each residence sampled that day.

Equipment:

- Storage containers (rigid cardboard boxes, large freezer style storage baggies or similar container) for soils, water and dust wipes.

Methodology:

1. At the end of each sampling day all collected environmental samples from each residence will be entered onto a "Chain of Custody Record" form (Form 910).
2. Add appropriate quality assurance samples as needed.
3. At the end of each sampling day all samples will be stored in secured location with their respective chain of custody forms.
4. Whenever the samples change hands, such as from environmental technicians to individual transporting samples to the laboratory accepting the samples, the chain of custody record will remain with the samples and be completed (signed and dated) by all associated individuals.
5. Samples are to remain in control of the individual who last signed for the samples, such as within eyesight or stored in an appropriate secured location.